Hypertension: Diagnostic Problem, Challenge and Dilemmas

Achmad Rudijanto

Abstract

An elevated arterial pressure is probably the most important public health problem. The prevalence of hypertension depends on both the racial composition of the population studied and the criteria used to define the condition. Patients with hypertension die prematurely, the most common cause of death is heart disease, stroke, and renal failure.

The JNC-7 report has introduced a new classification that includes term “pre-hypertension”. The new classification may make a new dilemma in the management since the main treatment of pre-hypertension is the lifestyle changes. What do we recommend to lean patients with pre-hypertension who are already following a prudent lifestyle?

The ultimate public health goal of antihypertensive therapy is the reduction of cardiovascular and renal morbidity and mortality. The question is, what should the blood pressure goal be? For patients without any compiling condition, it was assumed that 140/90 mmHg was desired treatment target level. For diabetic patient, it is reasonable to target a blood pressure well within the normal range, at most 130/80 mmHg. Some newer studies suggest that the target of treatment may force the recommended goal even lower; even for the patient without any compiling condition. For elderly individuals, a goal of 140/90 mmHg is appropriate.

Hypertension during pregnancy is one of important aspects, since blood pressure during pregnancy may change related to the gestational age. This is always subject of discussion because there is no evidence that pharmacologic treatment results in improved neonatal outcomes, lower blood pressure may, in fact uteroplacental perfusion and thereby jeopardize fetal development. It means that more attention is needed for hypertensive patients not only for treatment regimens choice but also the blood pressure target.

The accurate measurement of blood pressure is the sine qua non for successful management of hypertension. The operator should be trained and regularly retrained in the standardized technique, to avoid the chance of mismanagement.

Key words: hypertension, JNC classification, treatment target, blood pressure measurement.

Introduction

Hypertension is an increasingly important medical and public health issue. It is common, asymptomatic, readily detectable, usually easily treatable, and often leads to lethal complications if left untreated. The prevalence of hypertension increases with advancing age to the point where more than half of people aged 60 to 69 years old and approximately three-fourth of those age 70 years old and older are affected. The impressive increase of blood pressure to hypertensive levels with age is also illustrated by data indicating that the 4 year rates of progression to hypertension are 50% for those 65 years and older with blood pressure in the 130/85 to 139/89 mmHg range and 26% for those with blood pressure in the 120/80 to 129/84 mmHg range.

Worldwide prevalence estimates for hypertension may be as much as 1 billion individuals, and approximately 7.1 million deaths per year may be attributable to hypertension. The World Health Organization reports that suboptimal blood pressure (SBP >115 mm Hg) is responsible for 62% of cerebrovascular disease and 49% of ischemic heart disease, with little variation by sex. Data from observational studies involving more than 1 million individuals have indicated that death from both ischemic heart disease and stroke increases progressively and linearly from blood pressure levels as low as 115 mmHg systolic and 75 mmHg diastolic upward. For every 20 mmHg systolic or 10 mmHg diastolic increase in blood pressure, there is doubling of mortality from both ischemic heart disease and stroke.

Education has important role in the management of hypertension. Extensive educational programs in the late 1960’s and 1970’s by both private and government agencies, reduce the number of undiagnosed and/or untreated patients to the level of 25% by the late 1980s, with a concomitant decline in cardiovascular mortality. Unfortunately, by the mid-1990s, this beneficial trend began to wane. The number of undiagnosed patients increased to nearly 33%, the decline in cardiovascular mortality flattened, and the number of individuals with chronic diseases with untreated or poorly treated
hypertension increased. The prevalence of end-stage renal disease per million population increased from less than 100 in 1982 to more than 250 in 1995, and the prevalence of congestive heart failure from age 55 to 75 more than doubled between 1976 to 1980 and 1988 to 1991.5

The problems of hypertension is still unsolved. Although the understanding of the pathophysiology of elevated arterial pressure has increased, in 90-95% of cases the etiology is still largely unknown. It means, in most cases hypertension is treated nonspecifically, resulting in relatively high noncompliance rate up to 50-60%. The classification of hypertension always renews and makes a new dilemma in the management. Hypertension may also exist in association with other conditions in which the treatment of hypertension with other compelling condition or secondary hypertension needs more attention not only for treatment regimens choice but also for the blood pressure target.

NORMAL OR TARGET?

Observational studies have indicated that death from both ischemic heart disease and stroke increases progressively and linearly from blood pressure levels as low as 115 mmHg systolic and 75 mmHg diastolic upward. For every 20 mmHg systolic or 10 mmHg diastolic increase in blood pressure, there is doubling of mortality from both ischemic heart disease and stroke.4 Data obtained from the Framingham Heart Study have indicated that blood pressure values in the range of 130/85 to 139/89 mmHg are associated with a more than 2-fold increase in relative risk from cardiovascular disease compared to those blood pressure below 120/80 mmHg.6

For both systolic and diastolic blood pressure, the mean level is higher in men than in women in elderly adulthood, but the difference narrows progressively and is either nonexistent or reversed by sixth or seventh decade. In the non-pregnant women, there is a sexual dimorphism of blood pressure, such that women have lower systolic blood pressure levels than men during early adulthood, while the opposite is true after the sixth decade of life. Diastolic blood pressure tends to be just marginally lower in women than in men regardless of age.7

There is result in a progressively higher prevalence of high blood pressure and predominance of systolic elevations in blood pressure with aging.8 Isolated hypertension is defined by JNC-6 as a systolic pressure equal or greater than 140 mmHg with diastolic pressure of less than 90 mmHg, and most of the elderly have this type of hypertension.

In children and adolescents, hypertension is defined as elevated blood pressure that persists on repeated measurement at the 95th percentile or greater for age, height, and gender. (Table 1)

Table 1. 95th Percentile of Blood Pressure by Selected Age, by The 50th and 75th Height Percentiles, and by Gender in Children and Adolescents 9

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Girls' SBP/DBP</th>
<th>Boys' SBP/DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 50th percentile for height</td>
<td>Age 75th percentile for height</td>
<td>Age 50th percentile for height</td>
</tr>
<tr>
<td>1 104/58</td>
<td>105/59</td>
<td>102/57</td>
</tr>
<tr>
<td>6 111/73</td>
<td>112/73</td>
<td>114/74</td>
</tr>
<tr>
<td>12 123/80</td>
<td>124/81</td>
<td>123/81</td>
</tr>
<tr>
<td>17 129/84</td>
<td>130/85</td>
<td>136/87</td>
</tr>
</tbody>
</table>

Based on the epidemiologic study especially on lifetime risk of hypertension and the impressive increase in the risk of cardiovascular complications associated with levels of blood pressure previously considered to be normal, Joint National Committee (JNC) report introduced blood pressure classification. Within several years from JNC-6 to JNC-7, there were changes in blood pressure classification. (Table 2) The JNC-7 report has introduced a new classification that includes the term “pre-hypertension” for those with blood pressure ranging from 120 to 139 mmHg systolic and/or 80 to 89 mmHg diastolic blood pressure. The new category is intended to identify those individuals in whom early intervention by adoption of healthy lifestyle could reduce blood pressure, decrease the rate of progression of blood pressure to hypertensive level with age, or prevent hypertension entirely. Another change in classification from JNC-6 is the combining stage 2 and stage 3 hypertension into single stage 2 category due to the fact that the approach to the management of former two groups is similar.10, 11

Table 2. Change in Blood Pressure Classification11

<table>
<thead>
<tr>
<th>JNC-6 SBP/DBP</th>
<th>JNC-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal</td>
<td>&lt;120/80</td>
</tr>
<tr>
<td>Normal</td>
<td>120/80 – 129/84</td>
</tr>
<tr>
<td>Borderline</td>
<td>130/85 – 139/89</td>
</tr>
<tr>
<td>Hypertension</td>
<td>≥140/90</td>
</tr>
<tr>
<td>- stage 1</td>
<td>140/90 – 159/99</td>
</tr>
<tr>
<td>- stage 2</td>
<td>160/100 – 179/109</td>
</tr>
<tr>
<td>- stage 3</td>
<td>≥180/110</td>
</tr>
</tbody>
</table>
The classification by JNC does not stratify hypertensives by the presence or absence of risk factors or target organ damage. JNC-7 suggests that all people with hypertension (stage 1 and 2) be treated. The target or goal of treatment for individuals with hypertension without other compelling conditions are not the same as the people who associate with other compelling condition.

Common heart and kidney conditions, as well as major risk factors like diabetes mellitus, are often associated with hypertension. The ultimate public health goal of antihypertensive therapy is the reduction of cardiovascular and renal morbidity and mortality. Treating systolic blood pressure and diastolic blood pressure to target as in JNC-6 below 140/90 mmHg is associated with a decrease in cardiovascular disease complication. Setting therapeutic blood pressure goals for patients with diabetes and for those with renal insufficiency who are unquestionably at an exaggerated risk of cardiovascular events is challenging judgment. Some studies suggested that blood pressure target is more stringent than 140/90 mmHg providing additional protection for these patients, but it would be hard to disagree with the recommendations of JNC-7 authors that a target below 130/80 mmHg is appropriate for the high-risk patients. American Diabetes Association (ADA) also recommended a target below 130/80 mmHg which is appropriate for diabetes patients associated with hypertension.

It comes as no surprise that measurement of blood pressure during pregnancy is one of the most important aspects of prenatal care. In normal pregnancy, both systolic and diastolic pressure decrease about 5-10 mmHg by the middle of pregnancy, and than gradually increase to the starting level at term. Hypertension may precede pregnancy, but more commonly develops during pregnancy, in which case it may be classified as gestational hypertension or pre-eclampsia. Blood pressure level can change very quickly, the increase of blood pressure rarely starts before 20 weeks, but may be a major problem by the third trimester, around 24-36 weeks. Management of the hypertensive pregnant patient presents a major challenge. The clinician has two patients, the mother and the fetus, and two situations, the hypertensive woman who becomes pregnant and the pregnant woman who becomes hypertensive. This is always subject of lively discussion because there is no evidence that pharmacologic treatment results in improved neonatal outcomes, lower blood pressure may, in fact, impair uteroplacental perfusion and thereby jeopardize fetal development. In addition, the majority of pregnant women with stage 1 or stage 2 essential hypertension are at low risk for cardiovascular complications within relative short time frame of pregnancy. The report states that among women who have pre-existing stage 1 or stage 2 essential hypertension and normal renal function, most pregnancies can be expected to have good maternal and neonatal outcomes.

Lowering both systolic blood pressure and diastolic blood pressure reduces ischemia and prevents cardiovascular events in patients with coronary arterial disease, in part by reducing myocardial oxygen demand. One caveat with respect to antihypertensive treatment in patients with coronary arterial disease is the finding in some studies of an apparent increase in coronary risk at low levels of diastolic blood pressure. For example in the SHEP study, lowering diastolic blood pressure to < 50 or 60 mmHg was associated with an increase in cardiovascular events, including myocardial infarction. There is also a strong correlation between the severity of orthostatic hypotension and premature death as well as increased number of falls and fractures.

Is it better to say normal blood pressure or target blood pressure that must be achieved without any disadvantages?

CHALLENGE AND DILEMMAS

The JNC-7 is made up of experts in the field of hypertension selected by the sponsor of guidelines, The National Heart, Lung, and Blood Institute (NHLBI). This is the same government agency that sponsored the ALLHAT study, which itself has become the center of considerable controversy. JNC-7 classification may create a new disease. The biggest headline of JNC-7 was the creation of a condition called pre-hypertension. This term describes people who have blood pressure in the range 120/80 mmHg to 140/90 mmHg, at which point true hypertension begins. If the JNC-7 is perfectly correct, after all, data from the Farmingham cohort have indicated that, if we live long enough, just about all of us will eventually become hypertensive. Is there any blood pressure adjustment of hypertensive criteria for the elders or different target treatment?

For the people with pre-hypertension, the JNC recommends such time-honored strategies as losing weight, reducing dietary sodium, increasing consumption of fresh fruit and vegetables, cutting down alcohol use, and exercising. But what do we recommend to lean patient with pre-hypertension who are already following a prudent lifestyle? In fact, there is currently no evidence to indicate that lifestyle interventions will improve survival or prevent major cardiovascular events in persons with pre-hypertension, though these steps might help slow progression to established hypertension.
Now, new data from studies published in the October 25th issue of Archives of Internal Medicine, indicate that people with pre-hypertension are more likely to have other risk factors for heart disease and stroke and that, as a result, pre-hypertension has substantial health consequences. Should pre-hypertension be managed more aggressively?

What about hypertension in the elderly? Very commonly that isolated systolic hypertension is seen in the elderly. There are two definitions of isolated systolic hypertension. The European and World Health Organization stated that we should continue to define isolated systolic hypertension as above 160 mmHg. What data do we have with systolic pressure between 140 and 160 mmHg that risk is increased and that reducing pressure is beneficial in the old people?

**BLOOD PRESSURE MEASUREMENT**

The accurate measurement of blood pressure is the sine qua non for successful management of hypertension. There is a large market for blood pressure measuring devices not only in clinical medicine but also among the public where the demand for self measurement of blood pressure is growing rapidly. For consumers, whether medical or lay, accuracy should be of prime importance when selecting a device to measure blood pressure. However, most devices have not been evaluated for accuracy independently using two most widely used protocols: the US Association for the Advancement of Medical Instrumentation (AAMI) protocol and the standard set by British Hypertension Society (BHS). The criteria for fulfilling the AAMI protocol are that the test device must not differ from the mercury standard by mean difference > 5 mmHG or a standard deviation > 8 mmHg for systolic and diastolic pressure. The criteria for fulfilling the BHS protocol are that device must achieve at least grade B (where A denotes greatest agreement with mercury standard and D denotes least agreement).

Blood pressure may be measured satisfactorily with sphygmomanometer of either the aneroid or mercury type. The equipment, whether aneroid, mercury, or electronic, should be regularly inspected and validated. Select a cuff with an inflatable bladder of appropriate size. Proper size depends on the circumference of the limb on which the cuff is to be used. The width of the bladder should be about 40% of this circumference, 12 cm to 14 cm in average adult. The length of the bladder should be about 80% of this circumference, almost long enough to encircle the arm. There are six sizes of commonly available blood pressure cuff (Table 3). Using smaller than recommended cuff on larger arm typically results in an overestimation of causal blood pressure. In obese or muscular persons, the large adult size cuff is required for all those with an arm circumference at the mid humerus over 38 cm. In very large individuals, a thigh cuff is often necessary.

There is one studied prevailing cuffing habits and compared them with newly revised American Heart Association guidelines. Monitoring to the staff cuff applications found that miscuffing occurred in 65 (32%) of 200 blood pressure determinations on 167 unselected adult outpatients, including 61 (72%) of 85 readings taken on nonstandard size arms. Under cuffing large arms was the most frequent error, accounting for 84% of the miscuffings. Considering that, miscuffing distorts blood pressure reading by an average of 8.5 mmHg systolic and 4.6 mmHg diastolic.

<table>
<thead>
<tr>
<th>Cuff</th>
<th>Width, cm</th>
<th>Length, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>2.5-4.0</td>
<td>5.0-9.0</td>
</tr>
<tr>
<td>Infant</td>
<td>4.0-6.0</td>
<td>11.5-18.0</td>
</tr>
<tr>
<td>Child</td>
<td>7.5-9.0</td>
<td>17.0-19.0</td>
</tr>
<tr>
<td>Normal adult</td>
<td>11.5-13.0</td>
<td>22.0-26.0</td>
</tr>
<tr>
<td>Large adult</td>
<td>14.0-15.0</td>
<td>30.5-33.0</td>
</tr>
<tr>
<td>Thigh</td>
<td>18.0-19.0</td>
<td>36.0-38.0</td>
</tr>
</tbody>
</table>

Because the sounds to be heard (Korotkoff sounds) are relatively low in pitch, they are heard better with the bell type of stethoscope.

The operator should be trained and regularly retrained in the standardized technique, and the patient must be properly prepared and positioned.

The patient should have rest for at least 5 minutes and ideally should not eat, caffeine, exercise or smoke for 30 minutes. At least two measurements should be made and the average recorded. Patient should be seated quietly in a chair, with feet on the floor. The patient’s arms should be resting, free of clothing, and positioned so that the brachial artery is at heart level. When the patient is seated, resting the arm on a table a little above the patient’s waist is suitable. When taking a standing blood pressure, try to support the arm at a satisfactory level. Measurement of blood pressure in standing position is indicated periodically, especially in those at risk for postural hypotension, prior to necessary drug dose or adding a drug, and in those who report symptoms consistent with reduced blood pressure on standing. Normally, standing is accompanied by a small increase in diastolic blood pressure and small decrease in systolic blood pressure when compared with supine values. When changing from supine to standing, systolic pressure
normally decrease no more than 5 to 15 mmHg, whereas diastolic pressure rises slightly. Orthostatic hypotension is present when there is a supine to standing blood pressure decrease >20 mmHg systolic and/or >10 mmHg diastolic.

Blood pressure is subject to large degree of intrinsic variability. To minimize this variability multiple measurement must be taken, especially when the pulse is irregular. This is necessary because ventricular filling pressure varies considerably as a result of variability of diastolic filling time.

Center the bladder of the cuff over the brachial artery with its lower edge within 2.5 cm of the antecubital fossa. This leaves enough space so the stethoscope head can be applied inferiorly without touching the cuff that will generate background noise. Listening over the brachial artery by using the bell of the stethoscope with minimal pressure exerted on the skin. At the conclusion of the blood pressure measurement, there should be no lasting indentations in the areas where the head of the stethoscope is placed. Otherwise the systolic blood pressure is likely to be overestimated and the diastolic blood pressure to be underestimated because too great a pressure is exerted directly over the artery.

The peak inflation level of the mercury column should be determined by using palpation of the radial or brachial artery before the stethoscope is applied. For all subsequent blood pressure measurements, the cuff typically should be inflated 20 mmHg higher than the pressure at which the palpable pulse at the radial artery disappears. After pulsations are obliterated, deflate the cuff slowly, 2 mm/beat, but continuously decrease the cuff pressure while palpating the brachial artery for pulsations. The initial pulsations indicate the systolic pressure by palpation. Then completely deflate the cuff before filling it again.

Next recheck the pressure by auscultation over the brachial artery with the patient in the same position. Inflate the cuff up to the 20-30 mmHg higher than the pressure at which the palpable pulse at the radial artery disappears. Five phases of sounds called Korotkoff sounds are heard as the cuff pressure is gradually decreased. At phase 1, clear tapping sounds appear first. These represent the systolic pressure by auscultation. Phase 2 sound are softer tones that appear as the cuff pressure further decreases. Phase 3 sounds are louder. Phase 4 sounds is muffled tones and at phase 5 the sounds disappear. The initial palpations indicate the systolic pressure by palpation. Then completely deflate the cuff before filling it again.

The aspect of blood pressure measurement during pregnancy that has received the most attention has been the debate as to whether diastolic pressure should be registered by the 4th or 5th phase Korotkoff sound. Pregnancy is the only situation where phase 4 ever had much support as the best measure of diastolic pressure because it was stated that in many pregnant women, Korotkoff sounds might be audible even when there was no pressure in the cuff which would, of course, give a 5th phase diastolic reading of zero.

Measurements of blood pressure in both arms typically are obtained at the initial visit, and the arm with the higher blood pressure is used thereafter if the difference is greater than 10/5 mmHg. In such situations, there is often concern about coarctation of the aorta or Takayasu’s arthritis. Blood pressure measurement in leg should be commonplace in all young hypertensive at the first visit and may be useful in older people as a peripheral indicator of aortic insufficiency.

Errors in blood pressure measurements can occur through several mechanisms. An auscultator gap is a silent period occasionally occurring between phase 1 and phase 2 Korotkoff sounds. An auscultatory gap may be caused by venous distention or severe aortic stenosis. If the cuff pressure is not pumped above the systolic pressure, but to a point in the range of the auscultatory gap, the recorded systolic blood pressure could be falsely low. After the palpable pulse disappears, the auscultatory gap, if present, has been passed. If a gap is found, record the beginning and ending of the gap as follows: auscultatory gap between 105 and 95 mmHg.

A second potential error in blood pressure measurement involving the auscultatory gap is to call the disappearance of tones (at the auscultatory gap) the diastolic pressure. Palpation of pressure first and then listening to each phase of the Korotkoff sound prevents this mistake.

Another potential error in measuring blood pressure occurs in patients with prosthetic aortic valves. False high readings can result from transmitted prosthetic valve sounds, giving the impression of Korotkoff sounds.

A fourth potential error concerns arteriosclerosis. Cuff measurements of diastolic pressure in the elderly can be up to 40 mmHg higher than intra-arterial pressures because of inelastic arteries, or stiff pipes. Stiff pipes may be detected by Osler’s maneuver. Inflate the cuff above systolic pressure. Roll the brachial and radial arteries under the palpating finger. If the artery remains palpable without blood pressure, the patient has pseudohypertension of the elderly. Patients may have both stiff pipes and hypertension, which can be confusing and requires the use of intra-arterial pressure measurement.
Home Blood Pressure Measurements

Home blood pressure measurement may be useful in the management of many patients with hypertension and complicating conditions. The technology for obtaining accurate and reproducible blood pressure measurement outside the traditional medical environment has improved greatly in the last 20 years. Home blood pressure readings are typically lower by average 12/7 mmHg than measurement taken in the office, even in the normotensive subjects. Home readings can be helpful in evaluation symptoms suggestive of hypotension, especially if the symptoms are intermittent or infrequent.

Home blood pressure readings should be interpreted cautiously, carefully, and conservatively. There are no data from long term clinical studies that base all treatment decisions solely on home readings, but several preliminary reports show benefit from supplementing office blood pressure measurements with home readings. Many of the factors that contribute to blood pressure variability are more difficult to control in the home environment, including intrinsic circadian variation, food, alcohol, exercise, and stress. It is recommended that the patients who are interested in and capable of measuring their blood pressure at home do it at a fixed time of the day and record all the readings obtained.

Ambulatory Blood Pressure Monitoring (ABPM)

The JNC 7 suggests that ABPM may benefit patients by providing information on response to antihypertensive medication, improving compliance with therapy, and evaluating white coat hypertension. Several expert panels have defined the special situations in which ABPM is particularly useful (Table 4).

Table 4. Situation in Which ABPM is Useful

<table>
<thead>
<tr>
<th>No.</th>
<th>Situations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>High normal blood pressure without target organ damage</td>
</tr>
<tr>
<td>2.</td>
<td>Office or white coat hypertension</td>
</tr>
<tr>
<td>3.</td>
<td>Refractory hypertension</td>
</tr>
<tr>
<td>4.</td>
<td>Episodic hypertension</td>
</tr>
<tr>
<td>5.</td>
<td>Symptoms consistent with hypotension associated with antihypertensive</td>
</tr>
<tr>
<td>6.</td>
<td>Hypertension with autonomic dysfunction</td>
</tr>
<tr>
<td>7.</td>
<td>Nocturnal hypertension</td>
</tr>
<tr>
<td>8.</td>
<td>Evaluation of efficacy of antihypertensive drugs in clinical research</td>
</tr>
</tbody>
</table>

As a tool, however, there are some advantages and disadvantages of ABPM. This issues of advantages and disadvantages have been well documented (Table 5).

Table 5. Advantages and Disadvantages of ABPM

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many blood pressure and pulse measurements during 24-h period</td>
<td>Cost</td>
</tr>
<tr>
<td>Measurement diurnal variation</td>
<td>Limited availability of equipment</td>
</tr>
<tr>
<td>Measures blood pressure and pulse during daily activities</td>
<td>Disruption of daily activities from noise/discomfort (sleep quality, flaccid arm during measurement)</td>
</tr>
<tr>
<td>Can identify white coat hypertension</td>
<td>Limited normotensive data</td>
</tr>
<tr>
<td>No placebo effect</td>
<td>Limited guidelines (or consensus) for interpretation of data in individuals</td>
</tr>
<tr>
<td>Better correlation with target organ damage than other methods</td>
<td>Few long term prospective studies demonstrating utility compared with traditional blood pressure measurements</td>
</tr>
</tbody>
</table>

SPECIAL SITUATION IN HYPERTENSION MANAGEMENT

Hypertension may exist in association with other condition in which there are compelling indications for use of a particular treatment based on clinical trial data demonstrating benefits of such therapy on natural history of the associated conditions. Some of conditions that may associate with hypertension are ischemic heart disease, heart failure, diabetes mellitus, chronic kidney disease, cerebrovascular disease, metabolic syndrome, orthostatic hypotension, pregnancy, hypertensive crisis and urgencies, and others. In these conditions, treatments must be tailored, not only target of treatment but also the choice of drugs. Management strategies need to be focused on the patient’s goals. Optimal management strategies are likely to differ for patient types.

CONCLUSION

Hypertension is an increasingly important medical and public health issue. It is common, asymptomatic, readily detectable, usually easily treatable, and often leads to lethal complications if left untreated.

The problems of hypertension are still unsolved. Although the understanding of the pathophysiology of elevated arterial pressure has increased, in 90-95% of cases the etiology is still largely unknown. It means, in most cases the hypertension is treated nonspecifically, resulting in relatively high noncompliance rate up to 50-60%. The classification of hypertension always renews and makes a new dilemma in the management. Hypertension may also exist in association with other conditions...
conditions in which the treatment of hypertension with other compelling condition or secondary hypertension need more attention not only for treatment regimens choice but also the blood pressure target.

REFERENCES